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Application of management of innovation processes in enterprises: management approach, problems and recommendations

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Abstract

The aim of this paper is to identify the main aspects of management of innovation processes based on thorough analysis of the available scientific literature together with the results of empirical research. The focus is on management approach, i.e. how the enterprise effectively plans innovation processes and how organizes innovation activities, leads own employees and monitors implementation of innovation goals. Accordingly, it is possible to identify problem areas related to the application of management of innovation processes and propose appropriate recommendations to remove these problems. The paper can help the managers for effective management of innovation processes and related activities. The recommendations are intended to support the smooth application of management of innovation processes in the enterprise. The paper thus brings to managers a handy tool in a form of a set of recommendations (instructions) that are meant to support problem-free use of management of innovation processes within an enterprise.

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1. Introduction

The topic of managing innovation processes is currently highly up to date. In present, innovation as such represents for a company an important tool for increasing its competitiveness. Companies no longer develop their innovation processes and activities based on “impressions” or “gut feelings”, but rather based on knowledge derived from the opinions of their customers, employees and partners. They collect the necessary information, support

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creation of knowledge, explore market opportunities and make decisions about the need to create innovation. Companies aim to fully utilize their innovation potential. In order to be successful, it is needed to effectively manage these activities and to dynamically react to the ongoing market development.

2. Material and Methods

The aim of this paper is to identify the main aspects of management of innovation processes based on thorough analysis of the available scientific literature together with the results of empirical research. The focus is on management approach, i.e. how the enterprise effectively plans innovation processes and how organizes innovation activities, leads own employees and monitors implementation of innovation goals. There were used different methods by solving the defined problem, for example: content analysis - the study of documents, synthesis, comparative analysis, process analysis, statistical analysis, modelling, programming, empirical research methods and others.

Between October 2012 and January 2014 we conducted a research, whose primary goal was to gather and interpret information about the level of use of innovation processes management in the environment of Slovak enterprises. In total, 321 managers of small, medium and large enterprises from companies active in Slovak republic took part in the research. Calculated recommended sample size was 384 respondents. The survey covered 321 respondents. Following the conversion, the actual sampling error was at the level of 5.46%.

The survey focused on identifying situations in the various phases of innovation process. The first field of interest was represented by innovative ideas which may accrue from a variety of sources. In terms of Slovak companies, customers and their identified needs are the most frequently used source of innovative ideas (in 228 companies). The most frequently used sources of innovative ideas also include employees of the company (in 194 companies), analysis of competitive products and services (in 187 companies), Internet (in 175 companies), exhibitions, conferences, trade shows (in 166 companies), journals and publications (in 159 companies). As a significant source of innovative ideas can also be considered own research activities (115 companies) and the research of the partners of the company (in 98 companies).

Managers of Slovak companies identified as the main criteria for deciding on further elaboration of innovative ideas into innovative opportunities availability of funds (involved in decision-making to 25.81%). Other important decision criteria are the reality of demand, technological options, available knowledge in the issue and the availability of human resources. In terms of priorities for decision-making are time and the physical space in the development phase less involved.

The most used methods in the deployment phase of innovation are the techniques of development of the creativity (42.99%). The quite frequently used methods are conceptual methodological tools (24.61%), forecasting methods (19.63%) and pragmatic methodological tools (19.31%). On a small scale are also used techniques of knowledge management (14.64%) and innovative graphs (7.79%).

3. Results

Management of innovation processes in the company is a real problem, which are managers of the company faced. Number of factors participates in its provision, from theoretical concepts, through model solutions to practical applications (Salerno et al., 2015; Mol, Birkinshaw, 2009; Hamel, 2002; Bernstein, Singh, 2006). The biggest or the most significant problem can be seen in an absence of unified or complex and at the same time transparent management innovation processes model in the company. It can be said, based on the results from realized research, that on the present many companies try to manage their innovation activities and processes intuitively. However, companies must often solve various problems caused by their unpreparedness to manage innovation processes. On the base of the proper usage of various management functions (planning, organizing, leading people and controlling) the innovation process should be effectively managed. The communication is important role in this process.

Planning in the management of innovation processes represents a significant group of activities, using which are set innovation goals and by which are determined resources and ways for achieving them. Complexity and demanding character of this process increases with size of the company, with the increasing hierarchical level on

which it is performed, with the length of the time horizon and the number of involved parties (partners). Planning of innovation processes in a company requires:

- to anticipate future development of external and internal environment and the changes that occur in them (development of customers, change in segments, new communication tools, development of customers' demands, development of factors that influence customers' purchasing decisions...),
- to take into consideration interests of the various involved parties who take part on the innovation processes (employees, top management, suppliers, banks, partners, surroundings); interests of individuals, groups and society,
- to consider economic as well social conditions and their criteria,
- to arrange in hierarchy goals and tasks of innovation processes, which create conditions for internal harmony of relationships and processes and occurrence of synergistic effects; also to identify relationships and processes related to future innovation and to arrange them in hierarchy,
- to consider limitations of resources, their suitable allocation and efficient use for supporting innovation activities,
- to choose suitable methods and techniques that enable creation of innovation ideas and their evaluation and selection.
- Planning of innovation processes in a company can be also defined as a process of setting innovation goals for the company, their further elaboration, specifying resources and ways for reaching them.

The step - Setting innovation goals - represents a key element of planning innovation processes in a company. Role and significance of this process is major, because by it we also establish basis for effective innovation management and for achieving successful results in the form of fulfilled innovation activities. It also gives direction to all efforts placed into managing innovation processes in a company. Innovation goals define the course of a innovation process and are one of the prerequisites for its development (Hittmár, 2006).

Innovation goals in general represent future situations that are to be achieved by a certain time-specific moment. All of the future company innovation processes should be directed towards achieving these goals. Achieving innovation goals is realized through achieving individual tasks, into which are the goals structured.

Company that decides to manage its innovation processes needs to understand that its goals indicate where is the company heading in the process of creating the innovation and what it seeks to achieve or how it wishes to develop the innovation. Innovation goals are also the basis for the whole planning process and are the source of motivation for the employees engaged in the innovation processes. Finally, innovation goals represent the basis for control and evaluation of the realized innovation processes.

The other key step in planning innovation processes is the organization of resources. Resources are the limiting factor for taking advantage of opportunities in the external environment that are identified while seeking ways for achieving the set goals. The defined innovation goals can be achieved using the following resources:

- labor (employees, managers, owners...),
- material (material, energy...),
- capacity (technology, machinery, IT equipment...),
- financial (loans, profit, share capital...),
- other (information, time, licenses...).

In addition to the listed resources we could also add innovation capacity of the company. It is based on and interconnected with the total of knowledge, resources, experience, managerial capabilities and skills that the company has at its disposal for the purpose of managing innovation processes.

It is also highly important to specify the ways by which should be the previously set goals achieved. Typically there are several options – possible solutions. Here we talk about so called variants that may be formed by a combination of various resources in such a way that all of the goals are optimally achieved in their logical interconnectedness.

During the process of managing innovation processes in a company, company strategy is revised and modified so that it reflects the plans of top management regarding management of innovation processes. However, such a change can end up influencing the roles of multiple employees. Depending on the character and number of realized

innovation projects, it is necessary to revise the currently used company organizational structure and to adapt it to the current situation.

Given great variability of innovation projects, it is possible to use multiple types of organizational structures for their organization. The general rule is that the organizational structure adapts to the innovation project (content, complexity, extent, time needs) and not vice versa.

Organization remains of key importance in the process of managing innovation processes, especially in today's turbulent environment. Innovation management aims to ensure competitiveness of the company in such environment. However, for this to happen it is needed that the company is capable to dynamically react to the arising changes.

Here is room for using dynamic innovation organization structures, that offer immediate reaction and consequent change in configuration of employees and processes, as necessary. Dynamic innovation organization structures (champions, purpose teams, project teams, project centers...) are characterized by the following properties:

- ability to rapidly react to changes,
- decentralized management,
- use of the creative approach,
- flexibility in content and activities of the groups and individuals,
- acceptance of higher degree of uncertainty and risk in management,
- direct evaluation and testing of new ideas,
- focus on results,
- adequate number of management levels,
- administratively undemanding methods of management,
- high added value,
- informal team work,
- lower number of organizational elements and connections,
- lower requirements on the management system.

For the purpose of fulfilling the organizational needs related to managing innovation processes, a matrix of innovation organizational structures was created (Fig. 1). Innovation organizational structures are located in the matrix based on two main parameters – number of realized innovation projects and how demanding/ complex are the innovation projects.

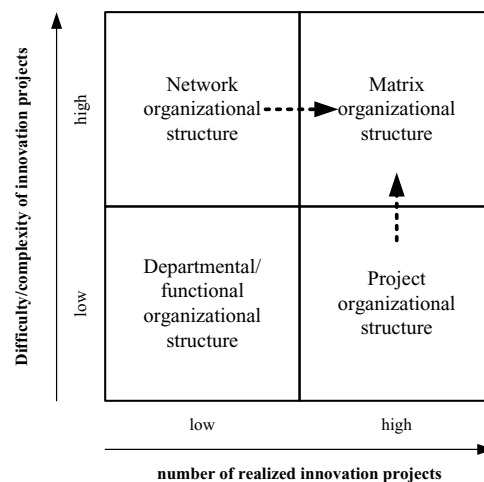


Fig. 1. Matrix of innovation organizational structures (Lendel, 2014)

In the first quadrant we can find *the functional organizational structure*. This is a classic organizational structure, suitable for situations with low number of realized innovation projects with relatively low complexity. Company employees are managed by their superior within a department to which they are assigned. Their work position does not change, i.e. they stay on their linear positions. Communication in this organizational structure takes a form of coordination work meetings of innovation teams. The role of line managers is to ensure the process of planning, realization and control of innovation processes.

In the second quadrant we can find *the project organization structure*. It is used mainly in situations when company realizes multiple projects with relatively low complexity. If necessary and if existentially important for the company, it is possible to use this organizational structure to deal with demanding and complex innovation projects (represented by the arrow in the Fig. 1). In this organizational structure, members of project teams are freed from their permanent work position.

In the third quadrant we can find *network organizational structure*. It enables to deal with complex and demanding innovation projects and if necessary also multiple projects at the same time (represented by the arrow in the Fig. 1). This organizational structure is characterized by high degree of flexibility and dynamics. Innovation projects are managed in required time and quality, while a relationship is being established with the main organization.

In the last quadrant we can find *matrix organizational structure*. Due to its structure, it enables dealing with multiple innovation projects with high degree of complexity. It also enables efficient use of company resources. Employees are managed by a project leader, while they also remain on their functional positions.

4. Discussion

The management of innovation processes in the company is for managers a challenging task. Causes of failure in this process can be multiple and may have a different character. For example, there may be a lack of innovation expertise, failure to secure information flow in the company, lack of education and motivation of employees and so on. Reasons of failure in the management of innovation processes are affected several actors. Firstly, they are managers, in the case of lack of support to innovative activities in the company, employees of the company, in the case of passive participation in the innovation process and customers, in the case of indifference in providing an added.

The management of innovation processes cannot be carried out only intuitively based on the development of the situation. This is a complex process with a numbers of aspects: the state of innovation potential, built IT infrastructure, staff evaluation system, organization and so on.

The task of these recommendations is to help reduce the risk of identified problems. They are designed to help the managers in the management of innovation processes, as well as prevention of the occurrence of problem situations. These can arise in the following areas: (Lendel et al., 2015)

- Problems in the information security of innovation processes,
- Problems in ensuring the innovation expertise,
- Problems in the application of management elements in the innovation process,
- Problems in measuring of innovation performance,
- Problems in the innovation process and the process itself.

As a problem in ensuring the information security in innovation processes arising in this field can be considered the inefficient information flows in the company. This is the reason of misunderstandings and employees cannot realize their innovative tasks entirely.

It is recommended to the managers to ensure the efficient work with information related to innovation in the company. This means that it is necessary to ensure the access to information to all interested parts in the innovation process, and it is necessary to collect all valuable information in one database and apply the principles of effective work with information.

Another problem is the lack of information systems to work with innovative ideas, opportunities and innovations. In many cases there is no evidence of implemented innovations and innovative ideas generated in the company. This often means that the potential innovative opportunities are left unused.

It is recommended to the managers to make a comprehensive record of innovative ideas and innovations in the company. Every innovative idea in the company have to be recorded and assessed. Same importance has the record of the currently unusable innovative ideas which have potential value for the future.

One of the problems in this area of the innovation expertise are the personal characteristics of managers and employees of the company focused on emphasizing their ego, what is seen in the subjective view of the solutions to the problem and ignoring acquired facts and reality. The result is incorrect decisions that adversely affect the conduct of the innovation process.

It is recommended to managers to evolve personal characteristics oriented to empathy, teamwork and also to logical thinking and self-criticism.

Insufficient implementation of knowledge management belongs to the common problems in the field of innovation expertise. On the one hand it is reflected as a lack of knowledge of the employees, on the other hand, much of the knowledge created in the innovation process is forgotten or lost. The result is unnecessary, repeated creation of new knowledge which is already created in the innovation process.

In the first case it can be recommended to the managers to ensure the management training courses designed to supplement the necessary knowledge to employees. In the latter case it is necessary to provide recording and archiving of acquired knowledge in the innovation process through the implementation of appropriate IT solutions.

In the area of ensuring the innovation expertise can be seen as a problem an inadequate usage of creative thinking in the development of ideas to solve the problem. The result is low number of ideas that do not allow to take a decision to resolve the problem.

It can be recommended to the managers to develop human creative potential in the company. It is necessary to create conditions for application of creative thinking selecting appropriate exercises to develop creative skills and abilities of employees. It would also be appropriate to create innovative teams, including representatives of the young and old. Innovative team should include representatives of several departments of the company (production, sales, logistics, trade, service).

Problem in the application of management elements in the innovation process is the lack of a coherent methodology for the management of innovation in the company. The managers can often exchange the innovation process by using of a simple type of creative brainstorming techniques. In many cases, they are in time and work stress and they do not pay attention to the support of innovation and integrating innovations into long-term strategic plans of the company.

The managers may be encourage to pay more attention to innovative activities of the company, turn them into long-term business objectives and incorporate them into innovative business strategy. It is also recommended to attending educational activities objected to the managing of innovation processes.

Another problem is the lack of development of the innovation program. In many cases, managers do not have sufficient information about available resources and means when they plan innovative activities. The result is the increased probability of failure of implementation of the innovation project.

It is recommended to carry out a detailed analysis of the current state of innovation potential and application of methods and techniques of project management.

Another problem is the absence of remuneration for innovative ideas and appropriate motivation program. The result is the passivity of employees who are not motivated to bring new innovative ideas and engage in innovative task solutions beyond their tasks and responsibilities. It is recommended to the managers to establish a fair system of remuneration for innovative ideas. It is necessary to develop appropriate motivation program, which involves employees in innovation activities of the company. Employees will be informed of the expected changes and motivation program will encourage open communication within the company.

Failure of the management of innovation processes can be caused by unsuitable organizational structure, which does not allow open communication between the stakeholders and does not support new innovations. It is recommended to the managers to rethink the current organizational structure, creation and implementation of flexible organizational structure that will have the ability to respond to changes in business environment and allow fast exchange of information, organization of meetings and activity of innovative teams.

A common problem in the measurement of innovation performance is non-evaluation of effects and benefits of implemented innovations. The result is that the company has no feedback on the adoption of innovations by the

customers, cannot measure their performance and take measures leading to continuous improvement of the management of the innovation process.

It is recommended to the managers to create an evaluation system focusing on the diagnosis of the results and contributions created and on the market launched new products. Based on the results it is also recommended to formulate measures to improve the management of the innovation process.

Problems in the innovation process and the process itself

A common problem is, that the first and the second phase of the innovation process is carried out insufficiently. In many cases it can be observed the development of the first innovative idea that pops up without detailed analysis. The result is the frequent changes and increased costs of implemented innovative projects. It is recommended to the managers to carry out a detailed analysis of all the innovative ideas and suggestions from internal and external environment. It is necessary to pay attention to the first two phases of the innovation process because they affect its success. Only the identification of valuable innovative ideas can bring successful innovation.

Another problem is the application of an inappropriate model of the innovation process, which reflected to a lack of a clear definition of the problem, the lack of coordination of activities, communication and cooperation within the staff of the various departments, but also of the stakeholders. The result is the unsuccessful management of innovative projects. It is recommended to the managers to be careful in choosing the model of the innovation process. It is necessary to know the company conditions, the level of knowledge of employees, the information security, the set of business processes and so on. There is a place for the usage of feedback in each phase of the innovation process, which may indicate deficiencies caused by improper setup.

The main problems include the lack of a mechanism for learning, which evaluates errors and variation, documented knowledge, rules and principles. Without its usage the continuous improvement of the management of the innovation process cannot be ensured. It is recommended to the managers to actively use the knowledge, closely monitor the progress of the innovation process and learn from the results of the different phases.

5. Conclusion

Effective management of innovation processes should identify weaknesses (gaps) and take measures to eliminate them. It should also be capable of delivering the necessary information related to innovation to responsible persons. A company should be prepared in the management of innovation processes to certain risks that may arise and cause failure of the realized innovation projects. If the company can identify these risks as soon as possible and prepare for them, it will significantly increase the success of management of innovation processes in the company.

In solving the defined problem were identified key weaknesses (gaps) and main difficulties of the innovation process management in terms of Slovak companies (empirical research realized by authors). Valued results of this study are also formulated recommendations how to correctly manage innovation processes in a company.

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